

VINOGRADOVA, I. B.

USSR/Physics - Wave Propagation

Sep 52

"Group Path in a Nonhomogeneous Magnetoactive Medium,"
M. B. Vinogradova, Chair of Wave Propagation

Vest Mos Univ, Ser Fizikomat i Yest Nauk, No 6,
pp 21-24

States that the group path had not been calculated with the influence of the magnetic field taken into account. Derives the formula for the altitude z of the "ordinary" and "extraordinary" ray versus frequency f . Concludes that one can compute by use of this formula the half thickness of the ionized

275T99

layer from both the ordinary and extraordinary branches of the altitude-frequency characteristics.

1. VINOGRADOVA, M. B.
2. USSR (600)
4. Radio Waves
7. Group traveling in a heterogenous, magnetically active medium. Vest.Mosk.un. 7 no. 9, 1952.

9. Monthly List of Russian Accessions, Library of Congress, March 1953, Unclassified.

GUSEV, V.D.; VINOGRADOVA, M.B.; DRACHEV, L.A.; MIRKOTAN, S.F.

Study of the heterogenous of the structure of the ionosphere.
Vest. Mosk.un. Ser.mat.mekh.astron. fiz. khim. 12 no.4:129-136
'57. (MIRA 11:5)

1.Kafedra rasprostraneniya, izlucheniya i kanalizatsii
elektromagnitnykh voln Moskovskogo gosudarstvennogo universiteta.
(Ionosphere)

ВИНОГРАДОВА, П. С.

В. Д. Гусев,
В. Н. Макаров

О применении системной теории турбулентности
в задачах расчета от струи турбулентности по-
ра при входе

В. Е. Канды,
М. Ф. Батраев,
Т. Г. Уралов

Формы распределения уровня сигнала (подле-
жно проверке)

10 июня
(с 10 до 16 часов)

В. Н. Герман,
В. Н. Догучко

К теории образования микроформы неоднород-
ностей в слое

В. Д. Гусев,
И. В. Кузнецов,
С. Ф. Марков

Самостоятельно результаты исследования по турбу-
лентности в слое δ

В. Д. Гусев,
С. Ф. Марков

М

И. В. Бурман,
И. В. Ковалев

О турбулентной стабильности системы, распро-
страняющей параллельные потоки микроформы неоднород-
ностей

В. Д. Гусев,
М. В. Виноградов,
Т. А. Гайман

Статистические свойства (без опыта, эксперимент
от микроформы)

В. Д. Гусев,
Т. А. Гайман

Об автоматизации обработки экспериментальных
данных при исследовании турбулентной микроформы

10 июня
(с 18 до 22 часов)

В. А. Баранов

Расчет аддитивности спектров высокочастотных радио-
лучей

И. Г. Шапкин

Графоаналитический способ расчета линий распро-
странения для различных условий работы

М

report submitted for the Centennial Meeting of the Scientific Technological Society of
Radio Engineering and Electrical Communications in. A. S. Popov (VSEEM), Moscow,
8-10 June, 1959

V. INCGRADOVA M. P.

3(6), 3(7)
Articles:

Osob. V. B., Breebey, L. A., Kirpichen, S. P., Berezin, Yu. V.,
Klyuzbnik, M. P., Inogradova, M. E., Gaylit, T. A.

30V/20-13-5-13/50

TITLE: The Structure and the Motions of Large-Scale Inhomogeneities
in the Ionosphere Layer F₂ (Struktura i dvizheniya krupnykh
neodnorodnostey v ionosfernom sloye F₂)

PERIODICAL: Doklady Akademi nauk SSSR, 1956, Vol. 123, Nr. 5, pp 817-820
(USSR)

ABSTRACT: The authors invented an integral phase method for the re-
cording of great ionospheric inhomogeneities. This
method is free from the deficiencies of other methods and com-
pists of the recording of the variations of the phase φ of
the reflected signal. For small inhomogeneities, these
variations are of the order 2 π , and for large-scale inhomoe-
geneities - of the order 40 - 200 π . This method has a high re-
sults precision (which amounts to dozens of meters) and a high re-
solving power. This permits the use of statistical methods
in the investigation of large-scale inhomogeneities. The
apparatus for the recording of phase variations consists

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The Structure and the Motions of Large-Scale Inhomogeneities in the
Ionosphere Layer F₂

of receiving and transmitting ionosphere stations with phase
indicators and photorecorders. The phase variations are re-
corded on a cinematographic film. The authors used a recording
apparatus with a bandwidth of 20-40 km side length. In each
of these points the variations of the phase of the reflected
signal were recorded. In this way, the authors found a regular
smooth curve for $\varphi_p(t)$ on which random-character variations
 $\varphi_p(t)$ (which are due to the presence of inhomogeneities and
disturbances in the ionosphere) are superimposed. The term
 $\varphi_p(t)$ is due to the variation of the height distribution of
the ionization of the ionospheric layers from day to night.
A suitable utilization of the results permits a separation
of φ_p and φ . (These 2 quantities are not exactly defined
in this paper). An analysis of the behavior of $\varphi(t)$ gives
data concerning the dimensions, the shape, and the motions
of the inhomogeneities. The following parameters were found:
The velocity V_p of the horizontal drift in the ionosphere and

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The Structure and the Motions of Large-Scale Inhomogeneities in the Ionosphere Layer F_2 SOV/20-123-5-15/50

its direction which is determined by the angle θ , the average shape of the ionosphere inhomogeneities etc. is determined by the "characteristic ellipse", the radius of correlation and the spatial dimensions of the inhomogeneities Δ , the time of spreading τ_0 or the parameter of spreading δ of the inhomogeneities. By analysis of the variations of the phase and of the rate of phase variation the direction of the reflected radioaves could be determined. The correlation functions were calculated by means of an electronic computer of the type "Sirois". All the above-mentioned results concern the layer F_2 , they were found from May 1957 to October 1957. The large-scale inhomogeneities of the distinctly anisotropic shape; the dimensions of the inhomogeneities. Numerical values are given for the dimensions of the inhomogeneities. The values of τ_0 are within the interval 0 - 40 km/min, and most frequently the values 5 - 10 km/min are found. The values of δ increase only slightly from night to day. Because of

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the presence of inhomogeneities in the ionosphere, the normal to the front of the reflected wave deviates from the vertical direction. For δ and τ_0 the average values $\delta \sim 0.1$ (day) and $\delta \sim 0.56$ (night) and τ_0 were found. There are 1 figure, 1 table, and 6 references, 2 of which are Soviet.

ASSOCIATION: Koskovskiy gosudarstvennyy universitet im. N. Y. Lomonosova (Moscow State University imeni M. V. Lomonosov)

PRESENTED: July 19, 1959, by B. N. Bogolyubov, Academician

SUBMITTED: July 17, 1958

Card 4/4

6 9783

S/055/59/000/06/09/027
B006/B005

9.9100

AUTHORS:

Gusev, V. D., Vinogradova, M. B.

TITLE:

Some Fundamentals for the Experimental Determination of the Law of Propagation¹ of a Continuous Random Function

PERIODICAL:

Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, No. 6, pp. 99 - 105

TEXT: The knowledge of this law of propagation is necessary, for instance, if ionospheric inhomogeneities are to be investigated the statistical properties of which may be assumed to be steady. The present paper analyzes the possibility of determining the laws of propagation of steady random processes if the process was recorded within a limited period of time. It may be shown that the accuracy with which the probability density can be determined depends on the ratio of the registration interval to the correlation radius of the steady random function. The restriction to be imposed on the extent of interval in the case where the function is unsteady is also indicated. Estimations of the ratio between the correlation radius with respect to time and the registration interval, and of the restriction to be imposed on an interval increase by an unsteadiness of

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Some Fundamentals for the Experimental Determination
of the Law of Propagation of a Continuous Random
Function

S/055/59/000/06/09/027
B006/B005

the random function, were carried out for random processes with a normal law of propagation, and also for a special form of the correlation function. The methods of estimating the accuracy of the correlation propagation laws may be also used for other special processes. The other form of the correlation function may lead to an inconsiderable change in quantitative relations. An analysis of the statistical properties of a signal phase reflected by the ionosphere shows that it is possible to use the method developed by the authors for investigating the statistical properties of unsteady random processes with indistinct unsteadiness. The results of this investigation may be also applied to investigations of statistical properties of functions representing the sum of steady random processes if their correlation radii considerably differ from each other. There are 2 Soviet references.

ASSOCIATION: Kafedra rasprostraneniya radiovoln (Chair of Propagation of Radio Waves)

SUBMITTED: March 17, 1959

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4

VINOGRADOVA, M. D.

BENDRIKOV, G.A.; KRASNUSHKIN, P.Ye.; REYKHRODEL', F.M.; POTEKIN, V.V.;
MUSTEL', Ye.R.; RZHEVKIN, K.S.; IVANOV, I.V.; KHARLANOV, A.A.;
TIKHONOV, Yu.V.; STRELKOVA, L.P.; KAPTSOV, L.N.; ORDANOVICH,
A.Ye.; KHOKHLOV, R.V.; VORONIN, E.S.; BERESTOVSKIY, G.N.; KRASNO-
PEVTSEV, Yu.V.; MINAKOVA, I.I.; YASTREBTSEVA, T.N.; SEMENOV, A.A.;
VINOGRADOVA, M.B.; KARPEYEV, G.A.; DRACHEV, L.A.; TROFIMOVA, N.B.;
SIZOV, V.P.; RZHEVKIN, S.N.; VELIZHANINA, K.A.; NESTEROV, V.S.;
SPIVAK, G.V., red.; NOSYREVA, I.A., red.; GEORGIYEVA, G.I., tekhn.
red.

[Special physics practicum] Spetsial'nyi fizicheskii praktikum.
Moskva, Izd-vo Mosk.univ. Vol.1. [Radio physics and electronics]
Radiofizika i elektronika. Sost. pod red. G.V.Spivaka. 1960.
600 p.

(MIRA 13:6)

1. Professorsko-prepodavatel'skiy kollektiv fizicheskogo fakul'teta
Moskovskogo universiteta im. M.V.Lomonosova (for all except Spivak,
Nosyreva, Georgiyeva).

(Radio)

(Electronics)

S/194/61/000/007/064/079
D201/D305

9.9100

AUTHOR: Gusev, V.D., Vinogradova, M.B. and Gaylit, T.A.

TITLE: Statistical properties of phase of a wave reflected from the ionosphere

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 7, 1961, 26, abstract 7 I168 (V sb. 100 let so dnya rozhd. A.S. Popova, M., AN SSSR, 1960, 220-227)

TEXT: The possibility is analyzed of determining the laws of distribution of continuous random processes from one experimental recording. The laws are determined of distribution of the irregular part of the phase related to the ionosphere in homogeneities of a wave. 8 references. [Abstracter's note: Complete translation]

VB

Card 1/1

VINOGRADOVA, M.B.

Radio wave diffraction on a regular phase screen. *Gecmag. i aer.*
5 no.1:90-96 Ja-F '65. (MIRA 18:4)

1. Moskovskiy gosudarstvennyy universitet, fizicheskiy fakul'tet.

Po-4/Pe-5/Pq-4/RG-4/rao-4/...

S/0203/65/004/001/0090/0090

ACCESSION NR: AP5005190

71
B

AUTHOR: Vinogradova, M. B.

TITLE: Radio wave diffraction on a regular phase screen

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 1, 1965, 90-96

TOPIC TAGS: radio wave, radio wave diffraction, ionosphere, radio wave propagation, Fresnel zone, diffraction

ABSTRACT: The author has investigated the propagation of a scalar wave, whose phase changes regularly as a result of passage through the ionosphere. It is shown that the relationship between the depth of penetration of the wave and the divergence of the scattered field is determined by the depth of penetration of the wave and the Fresnel factor. It is also demonstrated that divergence of the scattered field leads to an increase in the depth of field penetration. In some conditions in the field there are...

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ACCESSION NR: AP5005190

3

the field of scattering of a plane wave on an irregular phase or amplitude screen, the correlation functions of the field in the plane of the scattered field are calculated. The period of the correlation functions is determined. The correlation functions are calculated for a plane wave scattered by a screen with a random phase.

In conclusion, the authors thank V. I. Kiselev and M. P. Kivanovskiy for their assistance in the preparation of the manuscript. The authors also thank the staff of the Physics Department, Moscow State University for their assistance in the preparation of the manuscript. Formulas and figures.

ASSOCIATION: Fizicheskiy Institut, Moscow gosudarstvennyy universitet (Physics Department, Moscow State University)

SUBMITTED: 05 March

NO REF SOV: 003

INDEXED
OTHER: 004

SUB CODE: ES, EC

Card 2/2 ml

VINOGRADOVA, Marianna Bronislavovna; SEMENOV, Aleksandr Aleksandrovich;
ARMAND, N.A., red.; KLYAUS, Ye.M., red.izd-va; LAUT, V.G.,
tekhn. red.

[Principles of the theory of tropospheric propagation of
ultrashort radio waves] Osnovy teorii rasprostraneniia
ul'trakovotkikh radiovoln v troposfere. Moskva, Izd-vo AN
SSSR, 1963. 188 p. (MIRA 16:11)

(Radio waves)

7

Determination of meso-chlorine in the acridine series
 A. K. Ruzhentseva and M. E. Vinogradova, *Zhur. Anal. Khim.* 3, 113-17 (1948). The method is based on the mobility of μ Cl and the ease with which it is split off quantitatively to form HCl. Weigh out 0.3-0.4 g. of powd. sample into a 300 ml. flask, add 20 ml. of 20% H_2SO_4 , and reflux for 2 hrs. Cool, filter through fitted glass (60), wash to disappearance of Cl, and det. Cl in the filtrate by the Volhard method. If the substance is likely to be contaminated with a chloride, titrate a sample with silver, wash, and det. Cl. In a sep. sample det. Cl in the μ position. The difference between the 2 values is μ Cl.
 M. Hirsch

ASB-55A DETALLURGICAL LITERATURE CLASSIFICATION

CLASSIFICATION	INDEXING	SEARCHING	RECORDING	RETRIEVAL
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50
51	52	53	54	55
56	57	58	59	60
61	62	63	64	65
66	67	68	69	70
71	72	73	74	75
76	77	78	79	80
81	82	83	84	85
86	87	88	89	90
91	92	93	94	95
96	97	98	99	100

VINOGRADOVA, M.F.

Cholesterol metabolism intensity in the spleen and muscles
of irradiated rats. Radiobiologiya 5 no.2:218-220 '65.
(MIRA 18:12)

1. Biologicheskii institut Leningradskogo gosudarstvennogo
universiteta imeni Zhdanova.

L 54641-05

ACCESSION NR: AP5010341

UR/0205/65/005/002/0218/0220

AUTHOR: Vinogradova, M. F.

13
B

TITLE: Intensity of cholesterol metabolism in the spleen and muscles of irradiated rats

SOURCE: Radiobiologiya, v. 5, no. 2, 1965, 218-220

TOPIC TAGS: animal, rat, X-ray irradiation, single radiation dose, irradiation effect, cholesterol metabolism, spleen, muscle, blood

ABSTRACT: Cholesterol metabolism intensity of the spleen and muscles was investigated in X-irradiated rats (300 r dose) and control animals with the use of a radioactive sodium tracer method (details given in an earlier study). Following irradiation, cholesterol specific activity and cholesterol levels of the spleen, muscles, and blood were measured at regular intervals from 2h to 142 hrs. Also, specific activity of the spleen, muscle, and blood hemoproteins was measured at the same periods to determine the relative specific activity. Findings show that with a single 300 r dose cholesterol metabolism intensity and cholesterol level increase in the spleen,

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L 5001-01

ACCESSION NR: AP5010341

but remain relatively unchanged in the muscles. The higher lability of cholesterol metabolism in the spleen than in the muscles is attributed to the different functional roles of cholesterol in the two organs. Study data also confirm the position that radiosensitivity of hemopoietic organs is higher. Orig. art. has: 2 tables and 2 figures.

ASSOCIATION: Biologicheskii institut Leningradskogo gosudarstvennogo universiteta imeni A. A. Zhdanova (Biological Institute of the Leningrad State University)

SUBMITTED: 15Apr63

ENCL: 00

SUB CODE: LS

NR REF SOV: 008

OTHER: 003

Card 2/2

BEYDER, P.Ya.; VINOGRADOVA, M.F.; DERGACHEVA, S.N.

Certain problems in the development of petroleum-pipeline transportation in the stage of pre-project investigations. Transp. i khran. nefi no.8:33-36 '63. (MIRA 17:3)

1. Tsentral'nyy nauchno-issledovatel'skiy ekonomicheskii institut Gosplana RSFSR.

VINOGRADOVA, M.F.

Cholesterin metabolism in the organs of irradiated rats. Nauch.
dokl. vys. shkoly; biol. nauki no.1:89-91 '64. (MIRA 17:4)

1. Rekomendovana laboratoriyey radiobiologii Leningradskogo
gosudarstvennogo universiteta im. A.A.Zhdanova.

VINOGRADOVA, M.F.

Effect of X-ray radiation on the renewal rate of lipides
and cholesterol in the liver of rats. Vest. LGU 17
no.3:102-113 '62. (MIRA 15:2)

(RADIATION--PHYSIOLOGICAL EFFECT)

(LIPIDS)

(CHOLESTEROL)

UMANSKIY, L.I.; VINOGRADOVA, M.G.

Conference on the problems of will. Vop. psikhol. no.4:165-188
Jl-Ag '64. (MIRA 17:11)

VINOGRALOVA, M. I.

Stakhanov movement and mechanization in the textile industry Moskva, 1939. (Mic 53-317)
Collation of the original: 30 p.

Microfilm AC-100

U.S.S.R. / Human and Animal Physiology. Respiration. T

Abs Jour: Ref Zhur-Biol., No 5, 1958, 22244.

Author : Vinogradova, M. I.

Inst : Acad. Med. Sciences USSR. Leningrad.

Title : Stimulation of Efferent Nerves in the Lungs.

Orig Pub: Yezhegodnik. Inst. experim. Med. Akad. Med.
nauk SSSR 1955, L. 1956, 113-116.

Abstract: The efferent impulsation of low amplitude (20-30 microvolts), of the pulmonary branches of the vagus nerve in anesthetized cats, was characterized by an irregular order of propagation of separate potentials in some branches, and grouping; according to the rhythm of the pulse and respiration in others. The afferent impulsation increased in frequency during asphyxia. The inspiration - "salvos" - were

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U.S.S.R. / Human and Animal Physiology. Respiration. T

Abs Jour: Ref Zhur-Biol., No 5, 1958, 22244.

Abstract: considerably increased in frequency and amplitude by efferent impulsations at the level of the cervical segment of the vagus than at the level of the pulmonary branches. In separate branches the impulses were grouped in the rhythm of respiration. The impulsation, corresponding to the phase of inspiration, precedes slightly, the onset of the dilatation of the chest cage. The impulses are depressed by supplementary distension of the lungs and are increased by elevation of CO² content in the inspired air.

The efferent impulsation in the sympathetic branches of the upper thoracic ganglia of the

Card 2/3

75

U.S.S.R. / Human and Animal Physiology. Respiration. T

Abs Jour: Ref Zhur-Biol., No 5, 1958, 22244.

Abstract: marginal trunk is manifested by slow, bi-phasic summated discharges, grouped in a complex pulse and respiratory rhythm. The institution of artificial respiration is followed by some depression, asphyxia by marked intensification of afferent impulsion.

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USSR/Human and Animal Physiology. Blood Circulation.
General Problems.

T

Abs Jour: Ref Zhur-Biol., No 20, 1958, 93180.

Author : Vinogradova, M.I.

Instit

Title : The Competitive Inhibition of the Depressor Effect in
Stimulation of the Pulmonary Branches of the Vagus Nerve.

Orig. Pub: Fiziol. zh. SSSR, 1957, 43, No 6, 517-525.

Abstract: Cats anesthetized with barbiturates received stimulation to the pulmonary and lower cardiac branches of the vagus nerve, and also to receptors of one of the lobes of the lung by means of its being inflated through the bronchus. The blood pressure in the carotid or femoral arteries was recorded. In some of the experi-

Card : 1/3

USSR/Human and Animal Physiology. Blood Circulation.
General Problems.

T

Abstr Jour: Ref Zhur-Biol., No 29, 1958, 93180.

ments a record was kept of the oscillographic reading of the electric current in the pulmonary branches of the vagus nerve. With application of electro-stimulation of 50-100 frequencies per second and an intensity of 2 v a maximal effect was achieved in the form of reflex hypertension and, occasionally, of a lowering of the heart rate. By increasing the voltage and frequency, the reduction or complete elimination of hypertension was observed due to the development of competitive inhibition in the nerve centers. With inflation of one of the pulmonary lobes under a pressure of 40 - 50 mm Hg there were no signs of competitive inhibition in the vasomotor center nor of a lessening of reflex hypertension. The inflation

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USSR/Human and Animal Physiology. Blood Circulation. General Problems.

T

Abs Jour: Ref Zhur-Biol., No 20, 1958, 93180.

was accompanied by competitive inhibition in the pulmonary receptors themselves, but the flow of afferent impulses toward the vasomotor center did not reach a significant intensity. -- F.Z. Meyerson.

Card : 3/3

VINOGRADOVA, M.I.

Influence of closed pneumothorax on the afferent and efferent pulsation in the nerve conductors of the respiratory apparatus. Biul. eksp. biol. i med. 50 no.10:40-45 0 '60. (MIRA 14:5)

1. Iz otdela obshchey fiziologii (zav. - prof. A.V.Rikkl') Instituta eksperimental'noy meditsiny (dir. - chlen-korrespondent AMN SSSR prof. D.A.Biryukov) AMN SSSR, Leningrad. Predstavlena deystvitel'nym chlenom AMN SSSR P.S. Kupalovym.

(PNEUMOTHORAX) (RESPIRATORY ORGANS--INNERVATION)
(ELECTROPHYSIOLOGY)

SAVCHENKO, N.A., redaktor; KUGUKALO, I.A., ~~retsensent~~; VINOGRADOVA, M.M.
redaktor; GUBAREV, M.I., redaktor; ~~BEGICHEV, M.N., tekhnicheskii~~
redaktor.

[The Dnieper river; a guide book] Dnepr; putevoditel'. Izd. 2-oe.
Moskva, Izd-vo "Rechnoi transport, 2 1955. 365 p. (MLA 8:11)
(Dnieper river)

VINOGRADOVA, M N

82533

S/181/60/002/007/008/042
B006/B070

24.7700

AUTHORS: Vinogradova, M. N., Golikova, O. A., Mitrenin, B. P.,
Stil'bins, L. S.

TITLE: The Mechanism of Carrier Scattering in p-Type Germanium ^{il}

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 7, pp. 1428-1430

TEXT: It has been shown many times already that the temperature dependence of the hole mobility of germanium in the range 100 - 300°K corresponds to the law $u \sim T^{-2.3}$, and this contradicts the theory of carrier scattering on acoustic vibrations. It was proposed to take into account also the optical vibrations to overcome this difficulty. If this is done, the mobility falls rapidly for $T < \theta$, θ being the Debye temperature. To check this hypothesis, u -measurements for $T > \theta$ can be made. To be able to determine u directly from conductivity and Hall constant R , the range of impurity conductivity on the side of high temperatures must be increased. This increase takes place in more

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The Mechanism of Carrier Scattering in
p-Type Germanium

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S/181/60/002/C07/008/042
B006/B070

strongly doped samples. The authors used gallium-doped germanium with a hole concentration of $2.8 \cdot 10^{15}$ to $8 \cdot 10^{16}$. R was measured at 17,000 oe,

where $R\sigma = \frac{u_l p_l + u_h p_h}{p_l + p_h} = \bar{u}$. The index l refers to light and h to heavy

holes. If it is assumed that the temperature dependence of the mobility of holes of both kinds is the same, $\bar{u} = f(t)$ gives a correct description of the temperature dependence of the mobility of heavy holes. Fig. 1 shows $u(T)$ on a logarithmic scale for five samples of germanium with different hole concentrations (curves 2-6). Curve 1 gives the straight line corresponding to the $T^{-2.3}$ law. When the carrier concentration is increased, the slope of the curve approaches that of the straight line. Further investigations showed that the carriers of all samples are in a non-degenerate state at all temperatures. Lower values of the mobility in samples with high hole concentrations should, therefore, be explained as being due to the effect of a scattering from negatively charged acceptor ions whose number N is equal to the number of holes p. If it is assumed that the total number of collisions per second

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The Mechanism of Carrier Scattering in p-Type Germanium

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B006/B070

$\nu = 1/\tau$ (τ - relaxation time, $u = \frac{e}{m}\tau$) is the sum of collisions with thermal vibrations (ν_{th}) and ions (ν_i), a comparison of two samples with different hole concentrations may give ν_i , mobilities u_{th} and u_i , where $\nu_i = aN$ ($a=sv$, s being the mean ionic cross section, and v the mean hole velocity) and $\frac{1}{u_i} = \frac{m}{e} aN$. Figs. 2 and 3 show the results of the calculations. Fig. 2 shows $\frac{1}{u} = f(\lg T)$ for five samples, Fig. 3 shows $\Delta(\frac{1}{u})$ for different pairs of samples. If formula (1): $1/u_{th} = 1/u - 1/u_i$ holds for the mobilities, the $T^{-2.3}$ law is obeyed for all samples. Summarizingly, it may be said that between 100 - 450°K ν_i is independent of temperature (up to an accuracy of 10%), which diverges completely from the old theory. The mean free path of the carriers ($l = \tau v$) is, therefore, proportional to v and not to v^4 , as was assumed earlier. Taking into account the scattering of holes by thermal lattice vibrations, the $T^{-2.3}$ law is well obeyed in the range of temperatures considered.

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The Mechanism of Carrier Scattering in
p-Type Germanium

S/181/60/002/007/008/042
B006/B070

The authors thank I. V. Mochan for advice and discussions. There are 3
figures and 2 tables.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of
Semiconductors of the AS USSR, Leningrad)

SUBMITTED: March 5, 1960

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SOV/181-1-9-2/31

AUTHORS:

Vinogradova, M. N., Golikova, O. A., Yefimova, V. A., Kuta-
sov, V. A., Stavitskaya, T. S., Stil'bans, L. S., Syaoyeva, L.M.

TITLE:

Investigation of the Scattering Mechanism of Carriers in Some Semimetals

PERIODICAL:

Fizika tverdogo tela, 1959, Vol 1, Nr 9, pp 1333 - 1344 (USSR)

ABSTRACT:

The above investigations were conducted on lead tellurides and bismuth, and aimed at the following: 1) with electrons scattering on thermal vibrations of the crystal lattice, the dependence of the time τ required for the traveling of the free pathlength on the intensity of thermal vibrations and on the energy of electrons should be determined. 2) In the scattering on the ionized impurity atoms one finds the dependence of τ on the concentration of the impurities and also on the energy of the electrons. A qualitative picture of these phenomena should then be determined on the basis of the quantitative ratios thus determined. The investigations were mainly conducted on polycrystalline samples produced by powder metallurgy. The dependence of τ on the energy ϵ of the electron and also on the intensity of the thermal vibrations is still unclear; these

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dependences, however, can be separated from one another by appropriate investigations. Among other things, the following holds for lead telluride: $u \sim T^{-5/2}$ holds throughout the temperature range investigated for the mobility of a sample with the concentration of $5.7 \cdot 10^{17}$. In the case of concentrations of $2.4 \cdot 10^{18}$ and $1.5 \cdot 10^{19}$ $u \sim T^{-5/2}$ holds in the range of high temperatures, and in the case of low temperatures $u \sim T^{-3/2}$ holds. The latter sample is already partially degenerated at low temperatures, and this degeneration becomes stronger with increasing concentration of the carriers. The two-phonon processes are likely to play the principal part at higher temperatures. The temperature dependence of the mobility of degenerated and non-degenerated samples is characterized by the factor T^m . In this connection $m = -1/2$ holds, which corresponds to the electron scattering on the acoustic branch of the atom lattice. The dependences of the thermoelectromotive force on the temperature and on the

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concentration of the carriers are in satisfactory agreement with the theory. Also in the case of n-types Bi_2Te_3 and Bi_2Se_3 the dependence of the thermoelectromotive force on the concentration of the carriers is in good agreement with the theory. This also holds for the temperature dependence of mobility in Bi_2Te_3 with low thermoelectromotive forces and with low temperatures. The temperature-dependence of mobility is steeper with weakly degenerated samples of PbTe and Bi_2Te_3 than in the case of the strongly degenerated ones. Precisely the contrary, however, holds for bismuth sulfide. Next, the authors investigate the scattering of electrons on the ions of an impurity for the alloy 80% Bi_2Te_3 + 20% Bi_2Se_3 on pressed samples of the n-type. Cu^5 (donor) and Pb (acceptor) were selected as impurities. Mobility drops appreciably with increasing number of ions. In bismuth telluride, with scattering on the ions of the impurity, the time required by the electrons for traveling through the free pathlength does not depend on energy. Results obtained in the investigation under

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review agree with Erginsoy's theory (Ref 5). For Bi_2Te_3
 $\frac{1}{u(n)} = \frac{1}{u_0(n)} + S_1 n \epsilon^{1/2}$ holds. Here u_0 denotes the theoretical
dependence of u on n for $m = 1/2$, where n denotes the number
of electrons (and ions) and S_1 is the transversal cross section
of the ion. A similar relation also holds for the dependence
of the motion on temperature. There are 19 figures and
6 references, 4 of which are Soviet.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningr (Institute of
Semiconductors of the AS USSR, Leningrad

SUBMITTED: May 19, 1959

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VINOGRADOVA, M.N.; GOLIKOVA, O.A.; DUBROVSKAYA, I.N.; MOYZHES, B.Ya.

Thermo-e.m.f. in p-type germanium as dependent on concentration and temperature. Fiz. tver. tela 5 no.6:1657-1667
Je '63. (MIRA 16:7)

1. Institut poluprovodnikov AN SSSR, Leningrad.

VINOGRADOVA, M.H.; GCLIKOVA, O.A.; MITRENIN, B.P.; STIL'BANS, L.S.

Scattering mechanism of carriers in p-germanium. *Fiz.tver.tela*
2 no.7:1428-1430 J1 '60. (MIRA 13:8)

1. Institut poluprovodnikov AN SSSR, Leningrad.
(Germanium)

L 18001-63 EWP(q)/EWT(m)/BDS AFFTC/ASD 10/10

ACCESSION NR: AP3001287

S/0181/63/005/006/1657/1667

AUTHORS: Vinogradova, M. N.; Golikova, O. A.; Dubrovskaya, I. N.; Moyzhes, B. Ya.

TITLE: Thermoelectromotive force of p-type germanium in relation to concentration and temperature

SOURCE: Fizika tverdogo tela, v. 5, no. 6, 1963, 1657-1667

TOPIC TAGS: thermoelectromotive force, Ge, Ga, intrinsic conductivity, Hall effect, current carriers, Chromel, Copel, p-type semiconductor

ABSTRACT: The authors undertook this study because of lack of data on either polycrystalline material or single crystals having high concentrations of current carriers. They investigated single crystals in the concentration interval 7×10^{17} to 7×10^{20} per cm^3 and the temperature interval 300-950K. Specimens were prepared by zone refining, during which the Ge was alloyed with Ga. Concentration of current carriers was determined by measuring the Hall effect. To avoid errors resulting from surface attachment of thermocouples, the thermoelectromotive force was measured by thermocouples of Chromel-Copel welded to platinum pins driven into small holes (0.3 mm) in the specimens. Measurements at high temperatures were made in an argon atmosphere. Variations between computed and

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experimental values were observed for concentrations above 10^{20} per cm^3 at 300K and also for lower concentrations at temperatures above 300K. These have been explained by deviations from the square law of dispersion with increase of energy. This explanation is in agreement with the change of electrical conductivity, the Hall constant, and the thermoelectromotive force in the region of almost intrinsic conductivity. "The authors thank L. S. Stil'bens for his interest in the work, A. V. Ioffe for making the measurements on thermal conductivity, and A. V. Petrov for advice on the technique of measuring the thermoelectromotive force." Orig. art. has: 7 figures, 1 table, and 16 formulas.

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors, Academy of Sciences, SSSR)

SUBMITTED: 24Dec62

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SUB CODE: PH

NO REF SOV: 007

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Card 2/2

L 46929-66 EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JD
ACC NR: AP6015447 (N) SOURCE CODE: UR/0181/66/008/005/1336/1340

AUTHOR: Ayrapetyants, S. V.; Vinogradova, M. N.; Dubrovskaya, I. N.; Kolomojets, N. V.; Rudnik, I. M.

ORG: Institute of Semiconductors, AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR) 21 21 66 63 B

TITLE: Structure of the valence band of highly alloyed lead telluride

SOURCE: Fizika tverdogo tela, v. 8, no. 5, 1966, 1336-1340

TOPIC TAGS: valence band, telluride, thermal emf, carrier density

ABSTRACT: An attempt is made to determine quantitatively the parameters of the valence band by studying the electrical properties of highly alloyed lead telluride. The electrical properties of p-type lead telluride, having carrier concentrations of $2 \cdot 10^{18}$ to $1.4 \cdot 10^{20} \text{ cm}^{-3}$ (according to the Hall effect), are studied. The energy gap between the two valence zones is calculated, and the effective mass of heavy holes is determined. The temperature dependence of the thermal emf is used to determine the variation in the gap as a function of temperature. As temperature increases, the gap decreases ($\Delta E = \Delta E_0 - \alpha$), where $\alpha = 2 \cdot 10^{-4} \text{ ev/deg}$. Results, which are considered as interim, show that the valence zone structures of highly alloyed tellurides of lead, germanium, and apparently tin as well, are similar. Comparison with the results of

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other authors show a discrepancy for ΔE and m_T^A . The authors thank B. Ya. Moyzhes for participation in the work and Ye. K. Kamornik and A. G. Orlov for conducting the spectrum analysis of the sodium content in the samples. Orig. art. has: 4 figures.

SUB CODE: 20/

SUBM DATE: 15Jul65/

ORIG REF: 004/

OTH REF: 006

awm

Card 2/2

ACC NR: AP6033552

SOURCE CODE: UR/0181/66/008/010/2925/2928

AUTHOR: Kolomojets, N. V.; Vinogradova, M. N.; Lev, Ye. Ya.; Sysoyeva, L. N.

ORG: Institute of Semiconductors, AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

TITLE: Hall effect in semiconductors with two types of carrier

SOURCE: Fizika tverdogo tela, v. 8, no. 10, 1966, 2925-2928

TOPIC TAGS: Hall effect, semiconductor carrier, carrier density, temperature dependence, semiconductor band structure, *Current carrier*

ABSTRACT: The purpose of the paper is to clarify the influence of the presence of two types of current carrier of the same polarity on the Hall coefficient when account is taken of the variation of the energy gap ΔE with temperature, and to compare the calculated data with the experimental ones for p-type PbTe and for GeTe. The change in the Hall coefficient with decreasing fraction n_2 of the heavier carriers (holes), due to the change in the temperature and simultaneous decrease in the gap ΔE between the sub-bands is calculate for several carrier mobility ratios (5, 10, 20). The calculation shows that the Hall coefficient R_x should go through a maximum at a definite ratio n_2/n_1 , amounting to 0.95 and 0.92 for GeTe and PbTe respectively. R_x increases with increasing temperature (corresponding to an increase in n_2/n_1), in agreement with the experimental data, but at temperatures above 570K for GeTe and 400-450K for PbTe

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its experimental values begin to decrease, although theoretically it should reach a maximum at higher temperatures. The discrepancy is attributed to the appearance of carriers of opposite polarity, to a change in the overall carrier density due to the change in solubility of the doping metal, and to inaccuracies in the determination of the band parameters. Orig. art. has: 2 figures and 5 formulas.

SUB CODE: 20/ SUBM DATE: 15Feb66/ ORIG REF: 005/ OTH REF: 006

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VINOGRADOVA, M.R.

Changes in the vitamin C and cholesterol content of the blood
(taking into consideration the season of the year) in patients
with hypertension while under treatment with hydrogen sulfide
baths in different phases of diastasis. Vop. kur., fizioter.
& lech. fiz. kul't. 30 no.1:67-71 Jan '65. (NINA 28.6)

1. Otdeleniye lechebnogo pitaniya (Central'nogo instituta
kurortolog'ii i fizioterapii (direktor - kard. med. nauk
G.M. Pospelova), Moskva.

VINOGRADOVA, M.R.; NEVRAYEV, G.A.

Problems in treatment by the drinking of mineral waters. Vop.kur.,
fizioter.i lech.fiz.kul't. 27 no.3:266-272 My-Je '62.

(MIRA 15:9)

(MINERAL WATERS)

SAMARIN, G.A.; VINOGRADOVA, M.R.

Role of the digestive phase while taking hydrogen sulfide baths
in some changes in the circulatory system and cholesterol meta-
bolism in hypertension. Top. kur., fizioter. i lech. fiz. kul't.
29 no.2:132-142 Mr-Apr '64 (MIRA 18:2)

1. Otdeleniye leshch'nogo pitaniya (rav. G.A. Samarina) Tsentral'nogo
instituta kurortologii i fizioterapii (dir. - kand. med. nauk
G.N. Pospelova), Moskva.

VINOGRADOVA, M.R.
VINOGRADOVA, M.R.

Functional gastric changes in peptic ulcers under the effect of Borzhomi mineral water and some balneotherapeutic factors. Vop. kur., fizioter. i lech.fiz. kul't. 22 no.2:48-53 Mr-Apr '57.

(MIRA 11:1)

1. Iz otdeleniya lechebnogo pitaniya (zav. - prof. Badyl'kes [deceased]) Tsentral'nogo instituta kurortologii (dir. - kandidat meditsinskikh nauk G.N.Pospelova)

(PEPTIC ULCERS) (BORZHOMI--MINERAL WATERS)

NEVRAYEV, G.A., prof.; VINOGRADOVA, M.R., vrach

Batalinskaya. Zdorov'e 6 no.9:30-31 S '60.

(PYATIGORSK—MINERAL WATERS, SULPHUROUS)

(MIRA 13:8)

VINOGRADOVA, M.R., kand.med.nauk

Arzni. Zdorov'ie 6 no.12:28 D '60.
(ARZNI--MINERAL WATERS)

(MIRA 13:12)

VINOGRADOVA, M.R.

Influence of some methods of physical therapy and hydrotherapy
on the secretory function of the stomach in peptic ulcer patients.
Vop.kur.,fizioter.i lech.fiz.kul't. 25 no.1:7-13 '60.

(MIRA 13:5)

1. Iz otdeleniya lechebnogo pitaniya (sav. - prof. S.O. Badyl'kes
[deceased]) Tsentral'nogo instituta kurortologii (dir. - kandidat
meditsinskikh nauk G.N. Pospelova).

(PEPTIC ULCER) (STOMACH--SECRETIONS)
(BATHS, MOOR AND MUD) (MINERAL WATERS)

VINOGRADOVA, M.R.; BOGOSLOVSKIY, A.A.

Effect of Borzhomi mineral water on the motor-evacuatory and secretory functions of the stomach (X-ray study). Vop. kur., fizioter. i lech. fiz. kul't. 26 no.5:431-436 S-0 '61.

(MIRA 14:11)

1. Iz Tsentral'nogo instituta kurortologii Ministerstva zdravookhraneniya RSFSR (dir. - kand.med.nauk G.N.Pospelova),
(BORZHOMI---MINERAL WATERS) (STOMACH---SECRETIONS)

BADYL'KES, S.O.; VYGODNER, Ye.B.; VINOGRADOVA, M.R.

Treatment of peptic ulcer by rectal administration of novocaine
in combination with balneotherapy. Vop. kur.; fizioter. i lech.
fiz. kul't. 26 no. 14-218 My-Je '61. (MIRA 14:6)

1. Iz otdeleniya lechebnogo pitaniya (zav. - prof. S.O.Badyl'kes
[Deceased]) Tsentral'nogo instituta kurortologii.
(PEPTIC ULCER) (NOVOCAINE) (BATHS)

VINOGRADOVA, M. R., Cand Med Sci-- (diss) "On the functional changes of the stomach in ulcer patients under the influence of Borzhom mineral water, and certain physical and balneotherapeutic factors.(In conditions outside the health clinic)." Moscow, 1957, 16 pages (Central Institute of Health Resort Science) 200 copies (KL, 36-57, 107)

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